

# Voluntary Participation in Forensic DNA Databases: Altruism, Resistance, and Stigma

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## Abstract

The public's understanding of forensic DNA databases remains under-theorized and few empirical studies have been produced. This article aims to address this omission by exploring the answers to an open-ended question taken from an online questionnaire regarding the reasons for individuals' voluntarily accepting or refusing to allow their DNA profile to be included in the Portuguese forensic DNA database. The analysis is undertaken from the perspective of biological citizenship and the simultaneous empowering and disempowering effects of surveillance. The results indicate a pragmatic ethical framework that is linked to the cultural and emotional elements of altruism, resistance, stigma, and social representations of what is beneficial or harmful to the individual and to society. These

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subjectivities are anchored in commonplace images and metaphors for genetics, DNA, and forensic science that circulate in the messages transmitted by the media which pervade everyday life; hierarchies of trust in science and the justice system; and moral categories associated with the individual self-judgment in relation to crime, surveillance, and social order.

**Keywords**

DNA databases, public opinion, forensic sciences

**Introduction: Science and Technology Studies (STS) and Forensic DNA Databases**

In the last two decades, STS have made a considerable contribution to critical thinking about the creation and expansion of forensic DNA databases used to support criminal prosecution and criminal justice. Among the various lines of inquiry (Heinemann, Lemke, and Prainsack 2012), one significant area of controversy involves the legal, ethical, and civic issues relating to excessive state control over citizens and potential threats to civil rights. Sociolegal and ethical studies have largely explored the impact on the right to privacy, liberty, moral and physical integrity, human dignity, and the presumption of innocence (Krimsky and Simoncelli 2011; Lazer 2004; McCartney 2006; Toom 2012; Van Camp and Dierickx 2008), based mainly on a normative approach. STS research adds to this literature by exploring the flow of knowledge from sites and organizations that contribute to the coproduction and codevelopment of the various discursive practices that reflect the appropriate and legitimate uses of DNA technologies and forensic DNA databases. In a study conducted in the United Kingdom involving police officers, forensic scientists, crime scene investigators, legal professionals, legislators, and human rights groups, Williams and Johnson (2004) show that specific actors understand and represent DNA profiling in different ways. These distinct representations engender different commentaries about the legitimacy of forensic DNA databases as a proportionate response to crime. Such different views result from negotiations between distinct social positionings, the established epistemic authority of molecular biology, and the traditional ways this has become central to everyday assertions about the benefits and dangers of forensic DNA and incorporated into the criminal justice system (Williams and Johnson

2004, 208). Privacy and other civic rights are even more complex if one considers the different categories of individuals—offenders, victims, volunteers, relatives, and persons of interest—who might be requested to provide a DNA sample for analysis or identified through the profiling of someone else's sample during criminal investigation (Williams and Weinroth 2014, 82).

The collection of DNA samples from the human body in the course of a criminal investigation has also been discussed in terms of Michel Foucault's concept of "biopower." Victor Toom (2012) analyzed how biological bodies and bodily samples are fitted into forensic DNA practices situated at the intersection of science and law and examined how "private bodies" are turned into "public bodies." The implications of retrieving information based on biological samples in order to produce knowledge admissible in court have also been explored in studies that seek to understand the contingencies that arise from the circulation of scientific and technological knowledge and artifacts from the laboratories to the criminal justice system, which are stored in large computerized DNA databases and subsequently mobilized to track "suspect populations," produce "statistical suspects," and "prove guilt" (Cole and Lynch 2006; Lynch and McNally 2009).

From an STS perspective, more recent approaches explore in greater depth the contingencies and ambiguities of potential threats to civil rights emerging from the uses of forensic DNA databases. Regarding the transnational exchange of DNA profiles for forensic and police use within the European Union, Prainsack and Toom (2010) propose the concept of situated dis/empowerment to argue that there is an underconceptualization of agency (Jasanoff 2012), leading to an overemphasis on the oppressive aspects of DNA profiling and surveillance. Traditionally, the empowering effects of forensic DNA databases are focused on their potential to improve efforts to detect crime and identify suspects, which are, in turn, expected to reduce crime and increase public safety and security; while disempowering effects are included as threats to a range of civil rights, such as the right to privacy, liberty, moral and physical integrity, the dignity of persons, and the presumption of innocence. In a critique of the idea of a "pan-European bio-surveillance regime" that essentially conflicts with civil liberties, the authors emphasize the simultaneous empowering and oppressive effects of surveillance and suggest they are always intertwined and often mutually constitutive (Prainsack and Toom 2010, 1118). This perspective "leaves open the question of why surveillance works, and why individuals do not actively oppose surveillance and sometimes actively enlist in it" (ibid,

1128). Furthermore, it creates the context for a more nuanced debate about the social benefits and ethical costs of forensic DNA databases that challenges assumptions concerning the nature and meaning of human rights, the ethical risks of genetic technologies, and the potential public benefits of their uses (Jasanoff 2011).

A deeper understanding of how the simultaneous empowering and disempowering effects are interwoven into the public's understanding of forensic DNA databases is required, based on an approach that involves all citizens, particularly given that citizens sometimes see this kind of surveillance as potentially extending, rather than restricting, their civil rights and citizenship in broader terms (Machado and Silva 2014; Prainsack and Toom 2010; Wilson-Kovacs, Wyatt, and Hauskeller 2012; Wilson-Kovacs 2014). In fact, the public's understanding of forensic DNA databases remains undertheorized and empirical studies are still rare. This article aims to address this omission by analyzing the answers to an open-ended question included in an online questionnaire regarding the reasons why individuals would voluntarily accept or refuse to allow their DNA profile to be included in the Portuguese forensic DNA database.

The questionnaire was made available between October and December 2012. Respondents were invited to participate via the mailing lists of five public universities or research centers situated in different geographical areas of Portugal. The authors also distributed the questionnaire among their own professional and personal networks. A total of 711 questionnaires were completed. The questionnaire comprised six main sets of questions covering the following areas:

1. Information about the national forensic DNA database: sources of knowledge, assessment of information on the DNA database provided by the government and the media, and opinion on how the media should be involved in disseminating information to the public.
2. Perceptions of the benefits and risks of the national forensic DNA database.
3. Assessment of the efficiency of DNA technology and the value of DNA evidence in court.
4. Opinions on regulation of the forensic DNA database: custody, access, criteria for insertion, and deletion of profiles.
5. The individual's willingness to accept the inclusion of their own profile in the national forensic DNA database and the reasons for their answer.
6. Sociodemographic characteristics.

For the purposes of this article, we shall discuss only the results obtained from the following open-ended question included in the questionnaire: “Would you accept having your DNA profile inserted in the National Forensic DNA Database? Why?” In a previous publication (Machado and Silva 2014), the authors provided a quantitative approach to the answers obtained in reference to this question, by analyzing the impacts of the variables of gender, age, and educational level. We found that nearly one-quarter of the respondents would indicate “no,” and that it increased significantly with age and education. The overriding willingness to accept the inclusion of the individual genetic profile suggested an acknowledgment of the investigative potential of forensic DNA technologies and a relegation of civil liberties and human rights as a secondary concern in face of the perceived benefits of protecting both society and the individual from crime. In the current article, we aim to expand insights regarding public opinion on forensic DNA databases, which might contribute to ongoing discussions about biological citizenship and the empowering and disempowering effects of surveillance. The complexity and ambivalence of public views about forensic DNA databases indicate that there is a need to explore the finer details of individual and collective representations.

These data were systematically compared, contrasted, synthesized, and coded by theme, and subsequently by thematic category, closely following the principles of grounded theory (Charmaz 2006; Clarke 2005), then interpreted using a qualitative content analysis approach (Mayring 2004). The authors systematically compared the concepts contained in each single answer, and the similar concepts were grouped in a thematic category. In this article, we analyze the replies that were consensually considered by both authors as more illustrative of each thematic category that emerged from the content analysis. Such thematic categories reflect the subjectivities underlying the respondents’ manifested willingness or refusal to make a voluntary donation of a sample for profiling and inclusion in a forensic DNA database. We explore how they might reflect the ways in which individuals construct relationships with institutions and communities, elaborate on individual and collective rights and duties, and express ideas about the governing principles behind the uses of forensic genetic databases. Thus, the answers were analyzed by taking into consideration the processes of subjectification of power by which individuals “judge themselves” (Raman and Tutton 2009; see also Rose 2013) in relation to collective and institutional strategies for combating crime by using forensic DNA databases.

## The Public's Understanding of Forensic DNA Databases

Quantitative surveys carried out in New Zealand, Portugal, Spain, and the United States reveal a tendency toward positive public support for the inclusion of DNA profiles of convicted and recidivist offenders in forensic DNA databases (Dundes 2001; Gamero et al. 2007), a strong belief in the capacity of DNA technology to fight crime (Curtis 2009, 2014), and relatively few concerns about privacy issues in comparison with the benefits of the crime-solving potential of forensic DNA databases (Curtis 2014; Machado and Silva 2014). Studies conducted in Portugal (Machado and Silva 2014) and in New Zealand (Curtis 2014) consistently indicated an overriding willingness to accept the inclusion of individual genetic profiles in forensic DNA databases. In addition, qualitative data obtained during the UK Spring 2006 Mass Observation Directive "Genes, Genetics and Cloning" (Wilson-Kovacs, Wyatt, and Hauskeller 2012; Wilson-Kovacs 2014) showed that forensic DNA databases were seen as the least problematic of genetic applications and that, while acknowledging "human rights issues," the participants tended to prioritize the well-being of society over the risks of a society under excessive surveillance. Research involving male prisoners in Portugal (Machado, Santos, and Silva 2011) and young offenders in the UK (Anderson et al. 2010; Stackhouse et al. 2010) revealed their support for the expansion of forensic DNA databases and the creation of universal databases containing the genetic profiles of the whole population.

A simplistic approach would explain the public's enthusiasm for forensic DNA databases in terms of the influence of messages from the media emphasizing the "infallible capacity" of DNA databases to catch criminals (Brewer and Ley 2010; Cutter 2006; Kruse 2010). In fact, the uses of DNA technologies in crime investigation have been popularized in TV shows such as the world famous *Crime Scene Investigation* (CSI), contributing to the belief that science produces certainty and truth (Gever 2005; Kruse 2010), enabling crimes to be solved and strengthening the common good (Cavender and Deutsch 2007). The "moral authority effect" of CSI also reinforces punitive visions by highlighting the benefits of using forensic technologies to fight and prevent crime (Machado and Santos 2011).

Although the influence of everyday images and familiar metaphors projected through the media should not be underestimated, it has been suggested that the CSI effect may be more complex, encouraging viewers to reflect on the implications of DNA in terms of defining personhood and critically assess the meaning and significance of DNA testing and genetics

(Ley, Jankowski, and Brewer 2010). Recent literature shows that attributing such meanings is incorporated into individuals' everyday life experiences and is linked to their understanding of science and technology in general, and particularly their views on crime, surveillance, and social order (Wilson-Kovacs 2014). For example, prisoners' views of CSI revealed a grounded assessment of the TV show (Machado, Santos, and Silva 2012), in which tensions emerged between fictional images of criminal investigation and interpretations of the actual criminal justice system as tainted and corrupt. This is in line with Troy Duster's reflections on differential trust in DNA forensic technology: some people see DNA evidence as definitive, while others (such as Africans and Latinos living in poor neighborhoods in major cities in the United States) remain highly skeptical because they believe DNA technology may not be used fairly (Duster 2006, 294). The complexity and ambivalence of the public's understanding of forensic DNA databases has also been documented in research involving male prisoners in Austria (Prainsack and Kitzberger 2009), showing that forensic DNA technologies assumed the role of institutionalized archives of delinquency and thus affected identities. In addition, comparative research on the views of prisoners in Austria and Portugal indicated an awareness of how forensic DNA databases deepened stigmatization, although they were seen as powerful tools that provided protection against wrongful accusations (Machado and Prainsack 2012).

Aspects of national legislation may also influence the public's understanding of forensic DNA databases. In Portugal, regulation expresses social norms connected to the idea of voluntary citizen participation in the development of the national database. Regarding regulation of the criteria for including DNA profiles in forensic databases, the situation in Portugal involves two distinctively different features from other countries worldwide (Hindmarsh and Prainsack 2010): firstly, the willingness of the Portuguese government in 2005 to become the first to demand that all citizens and residents submit DNA for inclusion in the national databank; and secondly, the concept of "volunteering" to donate a genetic profile for inclusion in the national forensic DNA database (Duster 2012). The political project of creating a universal forensic DNA database in Portugal, and the concept of volunteer actually contained in the legislation, will be described in detail in the next section.

## **Volunteering for the Forensic DNA Database in Portugal**

The Portuguese forensic DNA database was established in 2008 under Law 5/2008, combining civil identification and criminal identification. The

legislation outlines the possibilities for gradually developing the DNA database by collecting samples from volunteers, either the relatives of missing persons or unidentified victims or anyone individual willing to donate a sample (Article 6[1] of Law 5/2008). In the context of this legislation, a volunteer is an active noncriminal who agrees to give a sample on his or her own initiative, without being approached by an agent of the justice system (Machado and Silva 2009). Samples are collected from volunteers on a basis of free and informed consent, following a sample collection request submitted in writing that must be addressed by the volunteer to the competent authority for DNA laboratory analysis—the Laboratory of the Scientific Police and the National Institute of Forensic Medicine (Article 6[2] of Law 5/2008). The profiles of volunteers can be cross-referenced with profiles from crime suspects and convicted individuals and should be preserved for an unlimited period of time. They can only be removed if the previous consent is explicitly withdrawn.

A request by a volunteer for their DNA profile to be included in the database may symbolically signify maximization of choice and a sense of individual responsibility toward maintaining social order. In addition, the genetic profile of the volunteer is received by the state as a voluntary gift and as the citizen's contribution toward expanding a database designed to fight crime and ensure public peace and security (Machado and Silva 2009). However, how do citizens engage with the social values embedded in the idea of volunteering to be included in the national forensic DNA database?

In the following sections, we explore the subjectivities emerging out of negotiating the meaning attributed to genes and the individual's biological material from the perspective of "biological citizenship" (Petryna 2002; Rose and Novas 2005; Rose 2007), addressing the following specific questions:

- Do citizens invoke a morality that "obliges the 'good' citizen to provide a sample of his or her body as a gift towards the common good" (Rose and Novas 2005, 440)?
- Do citizens view volunteering to contribute to the Portuguese forensic DNA database as an opportunity for civic participation and social engagement or as a surveillance mechanism that may threaten civil liberties?
- Is the voluntary donation of an individual's DNA profile to the forensic DNA database perceived as a way of extending citizens' rights, or diminishing them (Heinemann and Lemke 2014)?



- Do empowering and disempowering effects (Prainsack and Toom 2010) emerge in the public's understanding of voluntary inclusion in the Portuguese forensic DNA database?

## **Altruism and Neutralization of the Uses of DNA**

The motives presented by the participants who would agree to donate their own genetic profile to the national forensic DNA database express strategies that involve the “neutralization” of risks to civil liberties and human rights (Cole 2013). Neutralizing risk is accomplished by constructing an ethical framework guided by two main ideas: the predominance of the social values of solidarity and altruism, and a focus on the individual's responsibility to contribute to the collective good and well-being. The following answer illustrates an interesting combination of a recognition of “genetic exceptionalism” (Williams and Johnson 2004) as central to personhood (Nelkin and Lindee 1995) and the perception of the citizens' duty to help justice, describing DNA as a “secret” element of the personal essence of an individual that should be revealed by the “good citizen” in order to ensure collective security. In the words of one of our respondents, “As a citizen, I'm willing to give up the secrecy of my DNA profile for the sake of public security.”

Two main arguments were used to support neutralization of the potential risks for civil liberties and human rights: firstly, the fact that databases containing information about citizens are commonplace in present-day societies and, secondly, the belief that there are legitimate parameters for establishing forensic DNA databases. The following answer reveals how the participant has constructed a hierarchy of credibility for databases, ranking those that are developed beyond public scrutiny lowest, and those that engage citizens and encourage them to become involved in providing benefits for society and guaranteeing trustworthy uses of the data at the top of the hierarchy of “legitimate databases”:

We are included in other databases, often without our knowledge. However, in this case, there is the question of the public interest and the possibility of citizens contributing directly towards achieving speedy justice. The upstanding citizen whose conduct is exemplary will not be afraid of providing this kind of data, if it is guaranteed that the data will be processed correctly.

Some participants defended the legitimacy of a universal DNA database by making a connection between the notion of “genomic minimalism”

(Williams and Johnson 2004), which emphasizes the mundane character of forensic uses of noncoding DNA sequences, and the argument that supervision and control of the uses of the data should be guaranteed:

In my opinion, a database of genetic profiles using non-codified information should include ALL the population. The data that it contains is anonymous. In other words, it is only possible to assign an ID to a given genetic profile following authorization by a regulatory body. The information provided by a genetic profile is not indicative of genetic diseases or a propensity towards them. If regulated and controlled, a general database covering the entire population would be of enormous benefit to the community.

Another reason frequently cited for agreeing to the inclusion of one's own genetic profile in the forensic DNA database is viewing it as an "ordinary" technological development. As one of the respondents stated, "a universal database of DNA profiles makes as much sense as the current database of fingerprints. It is merely an advance in technology."

This "normalization" view is one of the processes by which individuals contextualize the uses of forensic genetic technologies in everyday life (Wilson-Kovacs 2014), and it can also be explained by taking into consideration the history of citizens' apparently passive compliance with the state's requirements to collect various types of personal identification data (Machado and Frois 2014). Unlike the situation in other countries, where the practice of taking fingerprints has been associated with criminal identification (Cauchi and Knepper 2009; Cole 2001; Finn 2005), the inclusion of fingerprints on identity cards has been extended to the entire population since the 1960s and appears to have entered into the everyday life of the Portuguese without contestation (Machado and Prainsack 2012, 40-43).

Other respondents who supported the creation of a universal DNA database emphasized the sensitive nature of genetic data, framing genetic exceptionalism in a context that clearly distinguished between acceptable and nonacceptable uses of genetic data. The following answer illustrates the tension between arguing that a universal DNA database can be framed around the principle of equality and the potential risks of creating or perpetuating genetic and social discrimination:

I think that all citizens should be included in the database. Any person (of any social class or ethnicity) could commit a crime. As long as our information is controlled and safeguarded, I don't see why all Portuguese citizens shouldn't have their DNA profile in the database. But we need to be careful; this

database can't be used for anthropological studies leading to dangerous conclusions about gender, ethnicity or geographical origin. Keep DNA away from pseudo scientific extremism! I think that everyone should contribute to enable offenders and potential victims to be identified.

Visions of altruism in the donation of a DNA profile for the forensic DNA database also emerge in connection with perceptions of the duties of a citizen, such as helping to protect vulnerable individuals and the whole community:

Because I consider it to be my duty as a citizen. Having one's profile in the database will not only help identify but also exclude suspects. It will also help with identification in the case of death or kidnappings; I consider this valuable for the general population.

The participants who stated that they would agree to donate their own genetic profile to the national forensic DNA database neutralized the eventual risks by combining the "duties" and "rights" of citizens in a complex and hybrid way. In terms of the perceived "obligations" of citizens, the emphasis was on solidarity, altruism, and the individual's responsibility to contribute to the well-being of society. The meanings attributed to the rights of individuals were constructed around the neutralization of the uses of forensic DNA databases, which were perceived as being legitimate due to their potential to engage citizens and protect society and individuals from crime.

## **Resistance and (Dis)trust**

The argument of genetic exceptionalism was also invoked by the participants who responded "maybe" to the question of the voluntary donation of a genetic profile to the Portuguese forensic DNA database. For these participants, the possible benefits of their eventual contribution had to be offset against the recognition of the exceptional nature of DNA and the subsequent possibility of retrieving data for purposes other than criminal identification. The participants mentioned many of the problematic ethical issues currently identified in bioethical literature, such as identification of kinship, health issues, and ethnicity, as well as more general concerns about contributing to a powerful surveillance system based on a biological catalogue of information (Williams and Johnson 2004, 2005):

Though I think that a DNA database would make the justice system quicker and more efficient, there is a tenuous dividing line that separates this from privacy of the individual. Other information can be extracted from DNA: percentage, illnesses, ethnicity, etc. Moreover, the database is part of a type of catalogue that doesn't appeal to me at all . . . .

Lack of confidence in institutions, in particular the perception that there might be inadequate control over access to the database, and concerns about the putative uses of genetic data, were some of the reasons most often cited for responding maybe to agreeing to include one's own genetic profile in the forensic database. Concerns about the misuse of DNA material to incriminate innocent people were also mentioned, in line with the arguments expressed by male prisoners in Austria and Portugal (Machado and Prainsack 2012) and by young offenders in the United Kingdom (Anderson et al. 2010; Stackhouse et al. 2010):

I believe that it could be useful to exculpate me if I was suspected of a crime—this is because I assume that I wouldn't commit a crime. My concern is that the opposite could happen, in other words, my data could be used to incriminate me for some reason. So, the problem for me is a lack of confidence in the institutions that are going to use and manage the database.

Together with the possibility of misuse or unauthorized access and threats to genetic privacy, the respondents also mentioned fears regarding controversial genetic research and potential discrimination arising from access by third parties:

I would only accept if I knew that the information would be properly controlled. Because genetic information should only be used to identify someone who was at the scene of a crime and left forensic clues behind. Never for differentiating between people according to their genetic background. In my opinion, if employers started to use the genetic information of individuals to screen for genetic illnesses they have or might have in the future, there would likely be discrimination when new employees were recruited. And I don't think we should allow things to get to that point!

Similar results were obtained in studies conducted in the United Kingdom (Wilson-Kovacs 2014; Wilson-Kovacs, Wyatt, and Hauskeller 2012), showing that the public emphasized the value of forensic DNA databases in protecting society from crime while also expressing concerns about improper access to data or excitement about the potential of DNA and

recognition of its benefits in police work together with a more critical attitude toward the idea of a wider national DNA database.

## **Stigma and Privacy**

The participants who stated that they would refuse to donate their own genetic profile to the Portuguese forensic DNA database tended to distance themselves from the population involved in criminal activities. This differentiation between criminals and law-abiding citizens means that the perception of safeguarding privacy changes according to the criterion by which only “good” citizens “deserve” privacy:

Having a clean record, I would consider it an abuse to be included in the system. Being included in the national DNA database signifies a loss of privacy. I agree with a DNA base for people with a criminal record. But not for those who have no criminal record.

The risk of stigma and society’s intolerance of those whose genetic profiles are included in forensic DNA databases were also cited by the participants in a very similar way to the meanings attributed to the forensic DNA databases by prisoners (Machado and Prainsack 2012; Prainsack and Kitzberger 2009) and ethnic minority groups (Duster 2006). Thus, being included in the database arguably deepens inequalities in the justice system:

I view the forensic database as a resource that facilitates police and judicial activities. But this would still be a stigma with extremely significant implications for the person concerned (who, before he was a criminal was a person and, as such, possesses inalienable rights). The database could function as a form of punishment.

The perception that forensic DNA databases may represent surveillance strategies that are less tolerant toward suspects (Lyon 2007) was frequently cited as a reason for not accepting the inclusion of one’s own profile in the forensic database:

Privacy and liberty should be protected today more than ever. Security and fighting crime are merely an excuse for human rights to be increasingly restricted. Would there be any logic in including millions of people in the register because of a potential threat?

The following respondent anchored her/his opinion in a conception of genetic exceptionalism (Williams and Johnson 2004) as central to personhood (Nelkin and Lindee 1995) and was willing to subordinate protection of individual rights for the sake of the development of science:

Because it is part of my personal patrimony and my individuality. Unless it was used for relevant scientific research, I don't see how it would be useful.

Negotiating between the risks of stigmatization and loss of privacy and liberty, on one hand, and the expected benefits of the uses of DNA databases, on the other, was central to the justifications provided by the individuals who refused voluntary inclusion in the forensic DNA database in Portugal. The risks were emphasized at the expense of the benefits in the case of forensic databases, although some participants attributed greater relevance to the benefits in the case of genetic databases destined for medical or scientific purposes. Maximizing the benefits associated with the "wonderful" world of science reveals the predominant moral authority of science, which may restrict opportunities for questioning the risks of scientific practices (Atkinson, Glasner, and Lock 2009; Jasanoff 2006; Webster 2006).

## Conclusion

This study provides further information on the public's understanding of forensic DNA databases by exploring the ethical complexities and differing representations and expectations underpinning public perspectives on voluntary participation in the expansion of the Portuguese forensic DNA database. Our analysis is drawn from the perspective of biological citizenship and the simultaneous empowering and disempowering effects of surveillance.

The public's views about forensic DNA databases provide novel aspects for the ongoing debate in STS on biological citizenship, namely, how individuals articulate the idea of nation-states keeping biological (genetic) information in large computerized databases and the rights and duties of the citizens. Recent discussions of how social scientists should conceptualize biopower today (Campbell and Sitze 2013; Lemke 2011) suggest a look at both the historical continuation and the changes of forms of government that produce complex combinations of direct and indirect means of controlling populations and individuals. One key feature of biopolitics is the creation of the "responsible and moral individual" on the basis of the rhetoric of "self-care," therefore supplanting forms of control from "above" by those from "below" (Lemke 2011; see also Raman and Tutton 2009).

A key element of biological citizenship in reference to volunteering to donate a genetic profile for inclusion in the national forensic DNA database is the coexistence of elements that may provoke discordance or generate new syncretic forms between views about genetic knowledge and control of individuals and populations and views about the rights and duties of citizens. The public's perspectives about the relations between the genetic information held by the state and citizenship are based not only on the ethical issues traditionally cited in relation to forensic genetic technologies—such as concerns about privacy, access, and other risks to civil liberties—but also on broader cultural and emotional elements (Lee, Scheufele, and Lewenstein 2005)—such as altruism, (dis)trust, and stigma—which coexist with social representations of what is beneficial and harmful to individuals and to society (Machado and Silva 2014; Wilson-Kovacs 2014). These views engage in a dynamic way concerns about self-care and the collective well-being of society (Lemke 2011; Rose and Novas 2005), and the perceived risks and benefits of the surveillance technologies that pervade everyday life (Ley, Jankowski, and Brewer 2010).

In revealing how citizens ascribe meanings to biological citizenship, the study also shows how these subjectivities refer to forms of empowerment and disempowerment (Prainsack and Toom 2010) that are embedded in a pragmatic ethical framework. The public's understanding of forensic DNA databases is related to meanings attributed to genes and the individual's own biological material and to interpretations of citizens' rights and duties and their individual and collective responsibility in terms of the altruism and solidarity associated with combating crime. These subjectivities also relate to the perceived threats to citizens' rights: in this respect, strategies of resistance and (dis)trust and fears of potential discrimination, stigma, and reinforcement of social inequalities arise from the fact that the state holds genetic information on citizens.

Cultural constructs of human rights and civil liberties relate to complex values, norms, and subjectivities that are historically interconnected, such as the balance between individual and collective rights and duties, the state–citizen relationship, and notions of human nature and social commitments to what is worth protecting and why. These normativities and subjectivities have been approached within the context of applications of genetic technology and human biological material in the medical field under the concept of biological citizenship (Rose 2007, 2013; Rose and Novas 2005) and genetic or biopolitical citizenship (Heath, Rapp, and Taussig 2004) and are also reproduced in other broad sociotechnical contexts, such as forensics. As suggested by Heinemann and Lemke (2014), when

discussing the potential of the concept of biological citizenship to analyze an empirical field outside medicine—the use of DNA analysis for family reunification in immigration issues, for example—genetic data can be used not only to expand citizens' rights but also to limit them.

The reasons for accepting, refusing, or being undecided about the possibility of having one's genetic profile included in the forensic database reveal bio- and technosocialities that reflect social representations of what is beneficial for society and the collective good, based on social categories derived from processes involving individual moral hierarchies and trust in social institutions. More specifically, the application of genetic technologies in the field of forensic criminal investigation is viewed as having important implications in terms of labeling the moral status of individuals, distinguishing, for example, between criminal suspects and "nonsuspects." These classifications are also associated with the hierarchies of trust placed in judicial and scientific institutions, differentiating between the fear of dangers and the collective and individual expectations of the potential benefits involved in the uses of genetic technologies by the criminal justice system and also by science in general. In this respect, participants refusing or hesitating to donate a genetic profile to the national forensic DNA database mentioned the possibility of illegitimate uses of the genetic data, particularly in the judicial field. Planting DNA material to incriminate, or conducting genetic studies that could lead to discrimination, were frequently cited concerns.

The subjectivities arising from the public's understanding of forensic DNA databases revealed forms of empowerment and disempowerment that are sometimes seen by citizens as being closely linked and at other times viewed as separate issues. Forms of empowerment are related to individual altruism and solidarity in contributing to the benefit of society and the neutralization of the uses of forensic DNA databases, within a framework of trust in the ability of DNA to identify the perpetrators of a crime (Williams and Johnson 2004). Empowerment is also fueled by strategies of resistance to surveillance and (dis)trust of the criminal justice system and/or science and technology. Disempowerment is identified via the perceived risks of the erosion of civil liberties and the dangers posed to human rights, in particular potential threats to privacy and the reproduction of stigma. Complex and hybrid forms of empowerment and disempowerment are linked to the familiar images and metaphors for genetics, in general, and forensic DNA, in particular, that are contained in messages from the media that pervade everyday life, a broader understanding of science and technology in general, and views and self-positioning in relation to crime, surveillance, and social order.



The discussion of the public's understanding of practices of volunteering in forensic DNA databases also holds the potential to open the ethical debate that has so far focused on the potential restriction of individual civil rights, while failing to consider concerns of collective and political nature, such as institutional oversight, public trust, and transparency in the governance of such genetic databases. On the other hand, our data also challenge the automatic association of "compulsory participation" with criminal genetic databases: as some studies showed, not only may convicted offenders see the inclusion of their individual genetic profile as a means of protecting their individual rights and increasing their chances of exoneration but, as discussed in this article (and in other works, such as Curtis 2014; Wilson-Kovacs 2014), ordinary citizens may also be willing to voluntarily donate a sample for profiling and inclusion in a criminal DNA database due to the perceived benefits of protecting both society and the individual from crime.

Possible and desirable routes in democratic societies should be built for effective public engagement that can account for the heterogeneity of knowledge and expectations and the certainties and ambiguities raised by forensic DNA databases. Considering the increasing expansion of networks for the transnational exchange of forensic genetic data, the study of the perspectives and attitudes of the public is crucial. It might sustain the development of international common ethical standards related with the use of DNA databases in a framework in which human rights and democratic rules are respected.

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